

REMARKS

Claims 9-13 stand rejected under 35 USC 103 over Ishiguro et al in view of Yamaguchi et al and claims 14-16 stand rejected under 35 USC 103 over Matsutani in view of Yamaguchi et al.

The subject matter of claim 9 is a spark plug in which the electrodes are formed of a first part made of substrate material, a surface part made of a material that is more durable than the substrate material and is fastened to the first part by a intermediate part, the joint between the surface part and the intermediate part being an explosion welded joint. The subject matter of claim 14 is a method of producing a spark plug in which the electrodes are produced from a first part made of a substrate material and a surface part made of a material more durable than the substrate material, and the method includes forming a blank comprising a surface part and an intermediate part by joining the surface part to the intermediate part by means of explosion welding.

In explosion welding of two plates, a clad plate is accelerated over a short distance into contact with a base plate. The impact with which the clad plate strikes the base plate results in the plates being bonded together by plastic deformation.

With respect to claims 9-13, the examiner argues that it would have been obvious in view of Yamaguchi et al to have used explosion welding to attach the ground electrode chip 60 to the ground electrode 40. Applicant respectfully disagrees. As shown in FIGS. 3A-3C of Ishiguro et al, the metal member 80 is placed between the ends 42 of the ground electrodes 40 and is seated on the top surface of the center electrode 30 and is welded to the ends 42 of the ground electrodes 40 and to the end 31 of the center electrode 30. Applicant submits that if explosion welding were employed to bond the metal member 80 to the end 31 of the center electrode, the metal member would be deformed at the edges so that it would not be bonded to the ends 42 of the ground electrodes 40.

Applicant therefore submits that the record does not show that it would have been feasible, let alone obvious, to attach the metal member 80 to the ground electrodes 40 by explosion welding. Applicant submits that claim 9 is patentable over Ishiguro et al and Yamaguchi et al and it follows that the dependent claims 10-13 also are patentable.

With regard to claim 14, the examiner relies on FIG. 3 of Matsutani and suggests that it would have been obvious in view of Yamaguchi et al to attach the firing end 13 to the ground electrode 1 by explosion welding. As a preliminary point, applicant respectfully points out that in connection with FIG. 1, Matsutani employs the reference numeral 13 to designate a firing portion 13 of the ground electrode 1. As described with reference to FIGS. 2a-2c, the firing portion 13 is formed by melting a disk 50 of noble metal material in a circular recess 14 of the clad metal 11 shown in FIG. 2a. In the description of FIG. 3, the numeral 13 is referred to as representing the firing end of the ground electrode rather than a firing portion, which is consistent with the electrode 1 shown in FIG. 3 not including a firing portion made of noble metal. Nevertheless, if we assume that the numeral 13 in FIG. 3 denotes a firing portion of noble metal, applicant respectfully submits that the record does not show that it would have been feasible, let alone obvious, to form the firing portion 13 by explosion welding of noble metal to the ground electrode 1.

The examiner further asserts that Matsutani discloses that a blank should be formed from which a part with a suitable form should be separated to form the electrode of the spark plug. Applicant respectfully disagrees. The blank referred to in the abstract of Matsutani and at column 1, line 41, for example, is not a blank from which the electrode is separated but is the member that is processed to make and constitute the electrode, i.e. the member that, after several process steps, itself constitutes the electrode.

Claim 17 includes all the limitations of claim 14 and requires in addition that two electrodes be formed.

In view of the foregoing, applicant submits that the subject matter of claim 14 is not disclosed or suggested by Matsutani and Yamaguchi et al, whether taken singly or in combination. Therefore, claim 14 is patentable and it follows that claims 15-17 also are patentable.

Respectfully submitted,



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